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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
CHEN, CHONGSHAN	

ART UNIT	PAPER NUMBER
2172	12

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/775,715	ABROL ET AL.	
	Examiner	Art Unit	
	Chongshan Chen	2172	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 January 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed on 22 January 2004 have been fully considered but they are not persuasive.

2. As per applicant's arguments regarding claim 1-12 Shoham does not disclose or suggest modifying the feature vector of the document based on sample of user actions captured during a search session have been considered but are not persuasive. Applicants agree that Shoham discloses that 1) the user provides an evaluation of each document viewed or 2) the system monitors the length of time that a document is viewed by the user in order to generate user feedback on page 10 of argument. This is a sample of user search behavior. The longer the time a user spent on viewing a particular document indicates the document is more interesting to the user. Furthermore, Shoham teaches modifying the feature vector of the document based on sample of user actions captured during a search session (Shoham, col. 12, lines 28-36, Each page $\vec{V}$ was viewed by the user and received an evaluation e_i (an integer in the range [-5, +5]). Given this information the weights of $\vec{M}$ were updated by addition: $\vec{M} \leftarrow \vec{M} + \sum_{i=1}^{\rho} e_i \vec{V}_i$). The step of $\sum_{i=1}^{\rho} e_i \vec{V}_i$ modifies and updates the feature vector of the document. Therefore, the user would use the negative/positive evaluation integer e_i to reflect the usër's interest. The feature vector of the document $\vec{V}$ would be updated to reflect the user's interest.

3. As per applicant's arguments regarding claim 1-12 the modification of the query vector in Shoham would have no effect on the queries of other users have been considered but are not persuasive. Shoham teaches modifying the feature vector of the document (please see the reason

given above). Furthermore, Shoham teaches a search method using score for each page by taking the dot product $\vec{V} \cdot \vec{M}$ (Shoham, col. 12, lines 9-35). Since the feature vector of the document $\vec{V}$ is modified, other user using this search method will receive modified search result also. Therefore, the modification of the query vector in Shoham would have effect on the queries of other users.

4. As per applicant's arguments regarding claim 13-26 Shoham does not disclose or suggest modifying the feature vector of the document nor does Shoham suggest update the feature vector of the document based on the sample user search behavior have been considered but are not persuasive. Shoham teaches capturing sample user search behavior and updates the feature vector of the document (please see the reason given above in item 2).

5. As per applicant's arguments regarding claims 14-19 and 21-26 Shoham does not suggest that the sample of the user behavior comprises a query feature vector of the terms in a particular query and the feature vector of the one or more documents returned based on the query and viewed by the user have been considered but are not persuasive. Shoham teaches a query feature vector (Shoham, col. 11, lines 28-27, vector $\vec{M}$) and feature vector of the document (Shoham, col. 11, lines 21-27, vector $\vec{V}$). Shoham teaches update the feature vector of the document by the step of $\sum_{i=1}^{p} e_i \vec{V}_i$, where e_i is an integer evaluation in the range [-5, +5], and update the query feature vector by the step of $\vec{M} \leftarrow \vec{M} + \sum_{i=1}^{p} e_i \vec{V}_i$ (Shoham, col. 12, lines 9-36). Furthermore, applicants agree that Shoham discloses that 1) the user provides an evaluation of each document viewed or 2) the system monitors the length of time that a document is viewed by the user in order to generate user feedback on page 10 of argument. This is a sample of the user behavior. The longer the time a user spent on viewing a particular document indicates the document is

more interesting to the user. This indication will be reflected when updating the document vector and query vector using the formula $\vec{M} \leftarrow \vec{M} + \sum_{i=1}^{p} e_i \vec{V}_i$. Clearly, Shoham teaches the sample of the user behavior comprises a query feature vector of the terms in a particular query and the feature vector of the one or more documents returned based on the query and viewed by the user.

6. As per applicant's arguments regarding claim 15 and 22 Shoham does not disclose the sample generating further comprises generating a sample during a sampling frequency have been considered but are not persuasive. Applicants agree that Shoham discloses that 1) the user provides an evaluation of each document viewed or 2) the system monitors the length of time that a document is viewed by the user in order to generate user feedback on page 10 of argument. Recording the user's viewing time of a document is a sample of user search behavior. Clearly, Shoham teaches the sample generating comprises generating a sample during a sampling frequency.

7. As per applicant's arguments regarding claim 18-19 and 25-26 Shoham does not teach wherein the scaling further comprises generating a negative/positive scaling factor in response to short/long viewing time so that the scaled query feature vector is negative/positive and the feature vector of the document is reduced/increased and the rank of the document is reduced/increases have been considered but are not persuasive. Applicants agree that Shoham discloses that 1) the user provides an evaluation of each document viewed or 2) the system monitors the length of time that a document is viewed by the user in order to generate user feedback on page 10 of argument. The longer the time a user spent on viewing a particular document indicates the document is more interesting to the user. Shoham further discloses

update the feature vector of the document by the step of $\sum_{i=1}^{p} e_i \vec{V_i}$, where e_i is an integer evaluation in the range [-5, +5], and update the query feature vector by the step of $\vec{M} \leftarrow \vec{M} + \sum_{i=1}^{p} e_i \vec{V_i}$ (Shoham, col. 12, lines 9-36). The less/longer the time a user spent on viewing a particular document indicates the document is less/more interesting to the user. Therefore, the user would use the negative/positive evaluation integer e_i to reflect the user's interest. The feature vector of the document and the feature vector of the query will be updated correspondingly, and the rank of the document will be updated correspondingly too.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 1-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shoham (5,855,015).

As per claim 1, Shoham teaches a system for user behavior based ranking of a document, comprising:

means for determining a feature vector associated with a document, the feature vector comprising weights for certain terms that appear in the document (Shoham, col. 11, lines 21-67); and

means for modifying the feature vector for the document based on user actions captured during a search session so that the document is more highly ranked in response to the user actions (Shoham, col. 12; lines 28-35).

Shoham teaches modifying the feature vector for the document based on user actions, but does not explicitly disclose it is based a sample of user action. However, Shoham teaches that the search heuristic includes a separate process which takes three random pages and one human-selected page and presents them to the user (Shoham, col. 12, lines 19-65). Thus, this process is clearly considered as the claimed sample of user selection. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the feature vector for the document based on a sample of user action. Because only select certain samples will significantly reduce the computational and network cost.

As per claim 2, Shoham teaches all the claimed subject matters as discussed in claim 1, and further teaches capturing user actions in response to a list of documents produced in response to a query (Shoham, Fig. 4, element 124, 126, present selected resources, col. 6, lines 1-4, "an information resource may be ... document", col. 2, lines 30-67, "The user interface displays information 'pages' ... The web facilitates retrieval and presentation of information resources utilizing standard presentation (HyperText Markup Language or HTML) and transfer protocols (HyperText Transfer Protocol or HTTP) ...". Clearly, the system of Shoham uses web to search documents and display the retrieved documents. Any person has used internet to search information knows the search engine returns a list of documents produced in response to a query) wherein the user actions include selecting a document from the list of documents (Shoham, col. 12, lines 28-35). Clearly, the search system of Shoham returns retrieved

documents to the user. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to produce a list of documents in response to a query so that it is easy for the user to view and navigate.

As per claim 3, Shoham teaches all the claimed subject matters as discussed in claim 2, and further teaches adjusting the weights of the terms in the feature vector that match terms in a query that produced the list of documents so that the ranking of the document is higher in response to the adjustment of the weights (Shoham, col. 12, lines 28-35).

Claims 4-6 are rejected on grounds corresponding to the reasons given above for claims 1-3.

As per claim 7, Shoham teaches a system for user behavior based searching of a document based on a query having one or more query terms, comprising:

means for determining a feature vector associated with a document, the feature vector comprising weights for certain terms that appear in the document (Shoham, col. 11, lines 21-67);

means for modifying the feature vector for the document based on user actions captured during a query of the document so that the document is more highly ranked in response to the user actions (Shoham, col. 12, lines 28-35); and

means for returning the same document to another user with the same query at a higher ranking due to the modified feature vector (Shoham, col. 12, lines 28-35, since the feature vector is modified, its weights are increased. When a user requests the same search, the same document will be ranked higher because it has higher weights than before).

Shoham teaches modifying the feature vector for the document based on user actions, but does not explicitly disclose it is based a sample of user action. However, Shoham teaches that

the search heuristic includes a separate process which takes three random pages and one human-selected page and presents them to the user (Shoham, col. 12, lines 19-65). Thus, this process is clearly considered as the claimed sample of user selection. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the feature vector for the document based on a sample of user action. Because only select certain samples will significantly reduce the computational and network cost.

As per claim 8, Shoham teaches all the claimed subject matters as discussed in claim 7, and further teaches capturing user actions in response to a list of documents produced in response to a query (Shoham, Fig. 4, element 124, 126, present selected resources, col. 6, lines 1-4, "an information resource may be ... document", col. 2, lines 30-67, "The user interface displays information 'pages' ... The web facilitates retrieval and presentation of information resources utilizing standard presentation (HyperText Markup Language or HTML) and transfer protocols (HyperText Transfer Protocol or HTTP) ...". Clearly, the system of Shoham uses web to search documents and display the retrieved documents. Any person has used internet to search information knows the search engine returns a list of documents produced in response to a query) wherein the user actions include selecting a document from the list of documents (Shoham, col. 12, lines 28-35). Clearly, the search system of Shoham returns retrieved documents to the user. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to produce a list of documents in response to a query so that it is easy for the user to view and navigate.

As per claim 9, Shoham teaches all the claimed subject matters as discussed in claim 8, and further teaches adjusting the frequency values of the terms in the feature vector that match

terms in a query that produced the list of documents so that the ranking of the document is higher in response to the adjustment of the frequency values (Shoham, col. 12, lines 28-35).

Claims 10-12 are rejected on grounds corresponding to the reasons given above for claims 7-9.

As per claim 13, Shoham teaches a computer implemented method for user behavior based ranking of a document, the method comprising:

ranking a document based on a feature vector of the document, the feature vector comprising frequency values for one or more terms that appear in the document (Shoham, col. 11, lines 21-67);

updating the feature vector of the document based on user search behavior so that the rank of the document is changed based on the user sampled user search behavior (Shoham, col. 12, lines 29-35).

Shoham does not explicitly disclose sampling user search behavior. However, Shoham teaches that the search heuristic includes a separate process which takes three random pages and one human-selected page and presents them to the user (Shoham, col. 12, lines 19-65). Thus, this process is clearly considered as the claimed sampling of user search behavior. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the feature vector for the document based on a sample of user action. Because only select certain samples will significantly reduce the computational and network cost.

As per claim 14, Shoham teaches all the claimed subject matters as discussed in claim 13, and further teaches a query feature vector of the terms in a particular query and the feature vector

of the one or more documents returned based on the query and viewed by the user (Shoham, col. 11, lines 21-67).

As per claim 15, Shoham teaches all the claimed subject matters as discussed in claim 14, and further teaches generating a sample during a sampling frequency (Shoham, col. 11, line 21 - col. 12, line 67).

As per claim 16, Shoham teaches all the claimed subject matters as discussed in claim 13, and further teaches combining the feature vector of the document with a feature vector of the query, the feature vector comprising frequency values for one or more terms that appear in the query (Shoham, col. 12, lines 9-14).

As per claim 17, Shoham teaches all the claimed subject matters as discussed in claim 16, and further teaches scaling the query feature vector based on the viewing time of the document by the user during the sampled user behavior to generate a scaled query feature vector (Shoham, col. 9, lines 2-8).

As per claim 18, Shoham teaches all the claimed subject matters as discussed in claim 17, and further teaches generating a negative scaling factor in response to a short viewing time so that the scaled query feature vector is negative and the feature vector of the document is reduced and the rank of the document is reduced (Shoham, col. 12, lines 29-35).

As per claim 19, Shoham teaches all the claimed subject matters as discussed in claim 17, and further teaches generating a positive scaling factor in response to a long viewing time so that the scaled query feature vector is positive and the feature vector of the document is increased and the rank of the document is increased (Shoham, col. 12, lines 29-35).

Claims 20-26 are rejected on grounds corresponding to the reasons given above for claims 13-19.

As per claim 27, Shoham teaches all the claimed subject matters as discussed in claim 1, except for explicitly disclosing sampling the actions of a plurality of users. However, Shoham's system has the sampling user search behavior capability (Shoham, col. 9, lines 2-8, col. 12, lines 28-39). It would have been obvious to one of ordinary skill in the art at the time the invention was made to sample the actions of plurality of user instead of one user. Sampling the actions of plurality of users will more accurately reflect which document is more interesting resource because the sampling means will have more feedback to study and draw the conclusion than feedback from a single user, which might be biased. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to sampling the actions of plurality of users in order to modifying the feature vector for the document. This will provide more accurate result.

Claims 28-32 are rejected on grounds corresponding to the reasons given above for claims 27.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Gillis (6,523,026) discloses a method for retrieving semantically distant analogies.

Conklin et al. (6,363,378) disclose ranking of query feedback terms in an information retrieval system.

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chongshan Chen whose telephone number is 703-305-8319. The examiner can normally be reached on Monday - Friday (8:00 am - 4:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E Breene can be reached on (703)305-9790. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

April 1, 2004

SHAHID ALAM
PRIMARY EXAMINER